

REMARKS

The above amendments and these remarks are responsive to the Office action dated October 7, 2005. Claims 1-39 are pending in the application. Claims 11-39 are withdrawn. Claims 1-10 are rejected. Applicants have amended claims 1-10. In view of the above amendments and the following remarks, Applicants request reconsideration of the rejected claims under 37 C.F.R. § 1.111.

Election/Restriction Requirement

Applicants have previously traversed the restriction requirement applied in the Office Action dated August 31, 2005. The restriction requirement under 35 U.S.C. § 121 has been made final. Applicants reserve the right to petition the Director to review the restriction requirement under 37 C.F.R. § 1.144.

Information Disclosure Statements

Applicants thank the Examiner for considering the Information Disclosure Statements previously submitted on January 23, 2004, June 25, 2004, and October 21, 2004.

Rejections under 35 U.S.C. § 112

The Examiner has rejected claims 1-10 under 35 U.S.C. § 112, first paragraph, and suggests that the specification does not reasonably provide enablement for a method of

curing adhesive between any two types of substrates, and therefore does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with the claims.

Without acknowledging the propriety of the rejection, Applicants have amended claims 1-10 in order to more particularly define their invention. In particular, the Applicants have amended the claims to recite a method of curing adhesive between disc substrates.

In view of the above amendments and remarks, Applicants request the withdrawal of the rejection of claims 1-10 under 35 U.S.C. § 112, first paragraph.

The Examiner has rejected claims 6, 8, and 10 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter that the Applicants regards as their invention.

In particular, the Examiner suggests that there is insufficient antecedent basis in claim 6 for the claim element "the circumference". Applicants have amended claim 6 to provide antecedent basis for this claim element.

The Examiner suggests that there is insufficient antecedent basis in claim 10 for the claim elements "the internal circumference" and "the external circumference". Applicants suggest the Examiner is referring to claim 8, and have amended claim 8 to provide antecedent basis for these claim elements.

The Examiner suggests that there is insufficient antecedent basis in claim 10 for the claim element "the high speed rotation". Applicants have amended claim 10 to provide

antecedent basis for this claim element.

In view of the above amendments and remarks, Applicants respectfully request the withdrawal of the rejections of claims 1-10 under 35 U.S.C. § 112, first and second paragraphs.

Rejections under 35 USC § 102

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Baggett et al (U.S. Patent 6,730,917).

The Examiner suggests that Baggett et al discloses a method for curing adhesive between substrates wherein a light emitting diode (LED) array (semiconductor elements) emitting ultraviolet light onto an adhesive spread between two substrates through one of the substrates. Applicants respectfully disagree.

The Baggett et al. reference is directed to “a compact user-friendly system to cure photo-curable adhesives with light” (col. 1, lines 37-39). In particular, Baggett et al. is directed to a system for “to bond objects underwater or in air under adverse conditions” (col. 1, lines 40-42). The system is able to “provide a safe, user-friendly system to cure adhesives and operable underwater by heavily gloved hands” (col. 1, lines 47-49). The apparatus of Baggett et al. is configured to be used under a variety of ambient conditions, for example, in the cold temperatures found in seawater (column 1, lines 16-28). Moreover, in Baggett, “These cold water conditions also are extreme for divers, and little time can be afforded to wait on adhesive to cure in a remote application. Divers do not have an acceptable quick

bonding adhesive system in demanding underwater applications where speed of curing is effective throughout the range of seawater conditions (90° F.-29.5° F.)."

In order to anticipate a claim, a reference must disclose each and every element of that claim. Further, the identical invention must be shown in as complete detail as is contained in the claim (see MPEP § 2131). Claim 1, as amended, recites a method of curing adhesive between disc substrates. The claimed method includes emitting ultraviolet light using a light emitting semiconductor element or a gas laser, and radiating the ultraviolet light onto adhesive spread between the first and second substrates through at least one of the first and second substrates, to cure or semi-cure the adhesive.

The apparatus of Baggett et al. is disclosed as useful for curing an ultraviolet curing adhesive used by for example, divers. There is no disclosure in Baggett et al. of curing an adhesive spread between a first and second disc substrate. It would be difficult to imagine a diver using the apparatus of Baggett et al. in this manner, as disc manufacture typically occurs in a manufacturing facility, not underwater.

The Examiner suggests that Figure 2 of Baggett et al. shows the claimed method. Applicants disagree. Figure 2 of Baggett et al. is reproduced below:

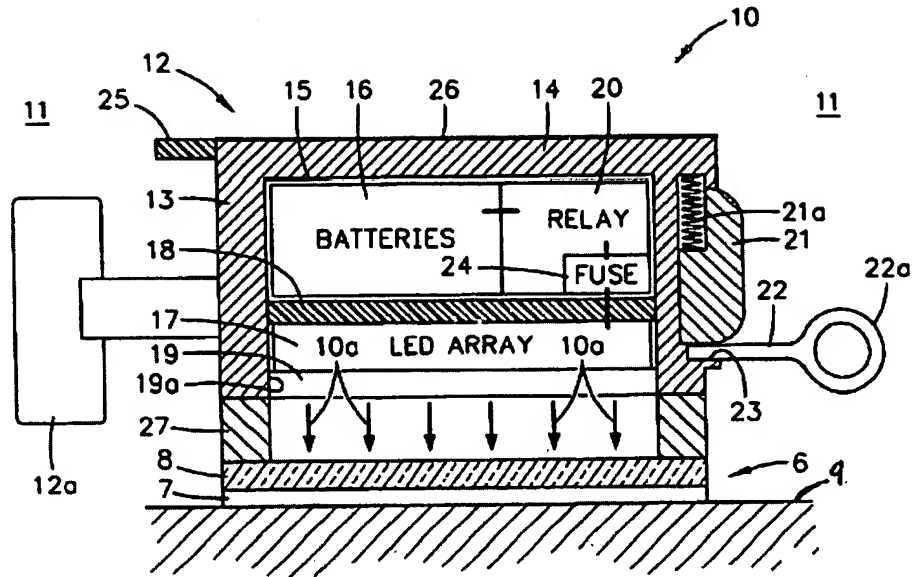


FIG. 2

As described at col. 2, lines 32-44, Fig. 2 depicts a radiation transparent structural member 8 being bonded to submerged slab 9 by way of the illumination of an envelope of photo-curable adhesive 7. Neither member 8 nor slab 9 is a disc substrate. Nor does Bagget et al. suggest or even disclose that the apparatus can be used for curing an adhesive between disc substrates. Applicants suggest that one of ordinary skill in the art at the time the invention was made would not have been capable of using the apparatus of Bagget et al. to produce disc substrates according to the claimed method. Therefore, Baggett et al. fails to anticipate claim 1 of the present application.

Claims 1, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Maenza (U.S. Patent 5,968,305). In particular, the Examiner suggests that Maenza discloses a method for curing adhesive between two disc substrates wherein a UV gas laser such as an excimer or YAG laser radiates ultraviolet light through one of the disc

substrates to the adhesive to cure it. Applicants respectfully disagree that Maenza discloses each and every element of the rejected claims. However, in order to facilitate prosecution of the instant application, Applicants have amended claim to recite “emitting ultraviolet light using a light emitting semiconductor element.”

As discussed above, in order to anticipate a claim, a reference must disclose each and every element of that claim. Further, the identical invention must be shown in as complete detail as is contained in the claim (see MPEP § 2131). Claim 1, as amended, recites a method of curing adhesive between disc substrates. The claimed method includes emitting ultraviolet light using a light emitting semiconductor, and radiating the ultraviolet light onto adhesive spread between the first and second substrates through at least one of the first and second substrates, to cure or semi-cure the adhesive.

The Applicants suggest that Maenza fails to anticipate the subject matter of claim 1, because Maenza fails to suggest or mention "using a light emitting semiconductor element," as recited in claim 1, and Maenza fails to suggest or disclose radiating ultraviolet light to "semi-cure said adhesive," as recited in claim 1. Applicants suggest that claim 1 is therefore not anticipated by the Maenza reference.

With respect to rejected claim 5, as claim 5 depends from claim 1, Applicants suggest that claim 5 is allowable in view of Maenza for at least the reasons provided above for claim 1.

With respect to claim 6, the Examiner suggests that Maenza teaches that the substrates are for optical recording medium and accordingly have a recording layer, and

Maenza further teaches radiating the adhesive from the inner circumference to an outer circumference. However, Maenza fails to disclose or suggest radiating the adhesive that protrudes from between the optical recording substrates, and only teaches scanning “from the inner edge 40 to the outer edge 42” or “from the outer edge 42 to the inner edge 40” (see col. 3, lines 46-48). Maenza fails to disclose illumination at a point beyond the edge of the substrate. In contrast, as set out at page 19, line 21 to page 20, line 10, Applicants have described the advantages of having a light emitting unit extending beyond the outer circumference of the substrates, in order to cure adhesive protruding from the outer edges of the disc substrates.

Although Applicants suggest that claim 6 is therefore distinguished from the disclosure of Maenza, Applicants take this opportunity to further amend claim 6 to more clearly distinguish the claimed subject matter. Applicants suggest that, particularly as amended, claim 6 is not anticipated by Maenza.

In view of the above amendments and remarks, Applicants respectfully request that the rejection of claim 1 U.S.C. § 102(e) and the rejections of claims 1, 5 and 6 under 35 U.S.C. § 102(b) be withdrawn.

Rejections under 35 USC § 103

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baggett et al (U.S. Patent 6,730,917), as applied above to claim 1 or Maenza (U.S. Patent 5,968,305), as applied above to claim 1. The Examiner suggests it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine

the necessary wavelength range for the UV radiation in the methods of Baggett et al. and Maenza. Applicants respectfully disagree, and suggest the Examiner has failed to establish the *prima facie* obviousness of the claims.

In order to establish a *prima facie* case of obviousness, each and every element of the claims must be disclosed in the prior art, there must be some suggestion or motivation in the prior art itself to modify the reference or to combine reference teachings, and the references must provide a reasonable expectation of success. Applicants suggest that the Examiner has failed to establish the *prima facie* obviousness of the rejected claims.

The Examiner suggests that, because it is well known and conventional in the art that adhesives have a lower UV transmissivity after being cured, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use conventional adhesives in the methods of Baggett et al. and Maenza. However, the prior art must also suggest the desirability of the claimed invention.

In this case, Baggett et al. is directed to a robust and simple LED-based device suitable for use in curing an adhesive underwater, by a diver encumbered by gloved hands. Maenza, in contrast, is directed to bonding optical recording substrates by curing a bonding material by scanning the recording substrate with a laser.

The device of Maenza could not be modified to be useful in the method of Baggett et al., because the Maenza apparatus would not be robust enough to survive immersion in water, would not be able to be operated by a diver in gloves, and is not described as curing the bonding material quickly, a requirement of Baggett et al. Similarly, the apparatus of

Baggett et al. could not be used in the method of Maenza, as the LED array of Baggett et al. cannot scan across an optical substrate, nor can it rotate an optical substrate. Where the proposed modification renders the prior art unsatisfactory for its intended purpose, or changes the principle of operation of a reference, there can be no motivation to combine the references (MPEP § 2143.01).

Furthermore, in order to rely on a reference as a basis for rejection of an applicant's invention, the reference must be in the field of applicant's endeavor or reasonably pertinent to the particular problem with which the inventor was concerned (MPEP § 2141.01(a)). As Baggett et al. is directed to underwater construction methods, not preparation of optical disc substrates, Applicants suggest that Baggett et al. is nonanalogous art with respect to both the present invention, and the Maenza disclosure, and that the combination of Baggett et al. with Maenza is improper.

For at least the above reasons, Applicants suggest the Examiner has failed to establish the *prima facie* obviousness of claim 1. As claims 2-4 depend from claim 2, Applicants suggest these claims are similarly patentable over the cited references.

With particular respect to claim 2, Applicants suggest that the cited references fail to disclose each and every element of the claim. Specifically, the cited references fail to disclose a method of curing adhesive between disc substrates where the ultraviolet light used has wavelengths in a range where a transmissivity of the adhesive before curing is lower than the transmissivity of the adhesive after curing. The ultraviolet light may have wavelengths in a range where a transmissivity of the adhesive before curing is lower than

the transmissivity of the adhesive after curing. This is a particularly advantageous aspect of the recited method, as the transmissivity of the ultraviolet light improves as the adhesive cures, making it possible to cure the adhesive more effectively (see the instant specification at page 4, lines 18-21). The cited references neither disclose this aspect of Applicants' invention, nor do they suggest the advantageous character of this aspect of Applicants' invention. Applicants suggest that claim 2 is independently patentable over the cited references.

With particular respect to claim 3, the Examiner suggests it would have been obvious to one of ordinary skill in the art to determine the necessary wavelength range for the UV radiation in the methods of Baggett et al. and Maenza. Applicants respectfully disagree. Applicants suggest the selection of the wavelength range of 280 to 450 nm, as recited in claim 3, results in a particularly advantageous method of curing adhesive between disc substrates. In particular, by selecting illumination at that wavelength, the influence of heat on the substrates can be reduced, and the transmissivity of the ultraviolet light improves as the adhesive cures, curing the adhesive more effectively (see the specification at page 4, lines 21-25). Additionally, where polycarbonate material is used for the optical disc substrates, the transmissivity of the substrate increases rapidly when the wavelength is longer than approximately 280nm, permitting more efficient curing of the adhesive (see the specification at page 16, lines 18-25). The cited references neither disclose this aspect of Applicants' invention, nor do they suggest the advantageous character of this aspect of Applicants' invention. Applicants suggest that claim 3 is

independently patentable over the cited references.

With respect to claim 4, the Examiner contends that one skilled in the art would have had the mechanical skill to determine the desired distance to optimize the curing process, and that it would have been obvious to do so in the methods of Baggett et al or Maenza. Applicants suggest this is an improper standard for establishing the *prima facie* obviousness of claim 4. As set out at MPEP § 2143.01, even where aspects of the claimed invention were individually known in the art, an assertion that the invention is obvious merely because the requisite modifications of the prior art would have been within the ordinary skill of the art is not sufficient to establish a *prima facie* case of obviousness, in the absence of some objective suggestion to combine the teachings of the references.

In addition, none of the cited references discloses or suggests the advantageous result of performing the method recited in claim 4, in particular where the distance between the emission surface of the light emitting semiconductor element or gas laser the the irradiated surface of the disc substrate is 10 mm or less. As set out in the specification at page 5, lines 1-5, under these conditions, the influence of heat on the optical disc can be reduced, and the adhesive can be cured more efficiently. The cited references neither disclose this aspect of Applicants' invention, nor do they suggest the advantageous character of this aspect of Applicants' invention. Applicants suggest that claim 4 is independently patentable over the cited references.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maenza (U.S. Patent 5,968,305), as applied above to claim 1, in view of Miyamoto et al (U.S.

Patent 6,309,485). The Examiner suggests that it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform two ultraviolet irradiation steps and transferring the assembly between steps in the method of Maenza.

Applicants suggest that, in view of the amendments and remarks above, claim 1 has been distinguished over the prior art, and that as claim 7 depends from claim 1, claim 7 is allowable over the prior art for at least the same reasons given above for claim 1. Additionally, while the Miyamoto et al. reference may describe two ultraviolet irradiation steps, such a two-step process is not disclosed in Maenza, and is incompatible with the adhesive curing process of Maenza. By scanning the optical recording substrates with the UV laser, the entire optical disc of Maenza is cured (see col. 1, lines 33-61 and col. 2, lines 4-19). Maenza fails to disclose any need of a provisional securing step, or any advantage in performing a provisional securing step. Where the proposed modification alters the principle of operation of a cited reference, there can be no suggestion or motivation to combine the references, and therefore *prima facie* obviousness cannot be established.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maenza (U.S. Patent 5,968,305), as applied above to claim 1, in view of Kanashima (U.S. Patent 6,231,705). The Examiner suggests that it would have been obvious to one of ordinary skill in the art at the time the invention was made to rotate the substrates at high speed to spread the adhesive and then to cure the adhesive with ultraviolet radiation from the inner circumference to the outer circumference in the method of Maenza.

The Examiner has introduced Kanashima and has rejected claim 8. However, the Applicants suggest that the subject matter of claim 8 is distinct from the disclosure of Kanashima. Claim 8 recites a method that includes "rotating said first and second substrates at high speed" in order to spread the adhesive, followed by ultraviolet radiation "while said substrate is rotated slowly, or stopped". Neither Kanashima nor Maenza disclose or suggest these aspects of the recited method. As set out in the specification at page 21, lines 1-14, "high speed" is considered to be "2000 to 6000 revolutions per minute," so that it is possible to remove "excess adhesive from between the substrates by its centrifugal force". After the high speed rotation, the adhesive layer becomes flatter in thickness, and the adhesive layer is cured "while said substrate is rotated slowly, or stopped". Therefore, it is possible to make the adhesive layer "a uniform desired thickness".

Additionally, by irradiating with ultraviolet light "while said substrate is rotated slowly, or stopped" the amount of radiation is equalized, yielding the advantageous result that the thickness of the adhesive becomes more uniform. Neither Maenza nor Kanashima disclose or suggest the method recited in claim 8, nor do the cited references disclose the advantageous results of performing the method recited in claim 8. In order to establish *prima facie* obviousness, the cited references must disclose each and every element of the claim. Applicants respectfully suggest that the Examiner has failed to establish the *prima facie* obviousness of claim 8.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maenza (U.S.

Patent 5,968,305), as applied above to claim 1. The Examiner suggests it would have been obvious to one of ordinary skill in the art at the time the invention was made to cure the adhesive in a reduced oxygen atmosphere in the method of Maenza, as such is conventional in the art.

With respect to claim 9, Applicants suggest that the cited references fail to disclose each and every element of the claim. Specifically, the cited references fail to disclose a method of curing adhesive between disc substrates where radiating ultraviolet light onto the adhesive protruding from between a first disc substrate and a second disc substrate occurs in an atmosphere where the oxygen concentration is lower than in air. This is a particularly advantageous aspect of the recited method, since the rate of curing for the adhesive slows in the presence of oxygen. By directing an inert gas to surround the adhesive to be irradiated, curing time is reduced (see the instant specification at page 6, lines 9-12; and at page 20, lines 5-10). The cited references neither disclose this aspect of Applicants' invention, nor do they suggest the advantageous character of this aspect of Applicants' invention. Applicants suggest that claim 9 is therefore independently patentable over the cited references.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maenza (U.S. Patent 5,968,305), as applied above to claim 1, in view of Ohno et al (U.S. Patent 6,613,170). The Examiner suggests it would have been obvious to one of ordinary skill in the art at the time the invention was made to cure the adhesive after detecting the thickness has been reduced to a preset thickness by high speed rotation in the method of

Maenza as such is conventional. Applicants suggest that, in view of the remarks above, claim 1 has been distinguished over the prior art, and that as claim 10 depends from claim 1, claim 10 is allowable over the prior art for at least the same reasons given above for claim 1.


In view of the amendments and remarks above, Applicants respectfully request the withdrawal of the rejection of claims 2-4 and 7-10 under 35 U.S.C. § 103(a).

It is believed that the subject patent application has been placed in condition for allowance, and such action is respectfully requested. If the Examiner has any questions or concerns, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned agent of record.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 11-1540.

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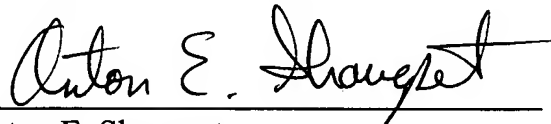
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